

WHAT IS CLAIMED IS:

- 1                    1.        A method for controlling velocity of a model vehicle, the method  
2 comprising:  
3                    providing a control wheel configured to rotate within a range of  
4 positions;  
5                    determining a speed of rotation of the control wheel;  
6                    correlating the magnitude of power provided to the model vehicle with a  
7 speed of rotation of the wheel.
- 1                    2.        The method of claim 1 wherein correlating the magnitude of power  
2 with a speed of rotation comprises multiplying a distance of rotation of the wheel by a  
3 factor determined from a time of wheel rotation.
- 1                    3.        The method of claim 2 wherein the distance of wheel rotation is  
2 multiplied by the factor when the speed of wheel rotation exceeds 200 ms/rotation.
- 1                    4.        The method of claim 2 wherein a value of the factor is proportional  
2 to the rotational speed of the wheel.
- 1                    5.        The method of claim 1 wherein correlating the magnitude of power  
2 provided to the model vehicle comprises generating an electrical pulse based upon rotation  
3 of the wheel by an increment of angular distance.
- 1                    6.        The method of claim 5 wherein the electrical pulse is generated by  
2 an optical detector receiving light transmitted through a gap of a rotatable disk in  
3 mechanical communication with the wheel.
- 1                    7.        The method of claim 5 wherein the electrical pulse is generated by  
2 an optical detector receiving light reflected by a strip located of a rotatable disk in  
3 mechanical communication with the wheel.
- 1                    8.        The method of claim 5 wherein the electrical pulse is generated by a  
2 magnetic detector positioned in proximity to a magnetic element of a rotatable disk in  
3 mechanical communication with the wheel.

1                    9.        The method of claim 1 further comprising controlling a polarity of  
2 change in the velocity of the model vehicle based upon a phase difference between voltage  
3 signals output by optical detectors positioned at different locations along a disk rotational  
4 path.

1                    10.      The method of claim 1 wherein correlating the magnitude of power  
2 provided to a model vehicle comprises correlating the magnitude of power provided to a  
3 rail of a model train set.

1                    11.      The method of claim 1 wherein correlating the magnitude of power  
2 provided to a model vehicle comprises correlating the magnitude of power provided to a  
3 remotely controlled toy selected from the group consisting of a train, a car, and a plane.

1                    12.      An apparatus for providing power to a model vehicle, the apparatus  
2 comprising:  
3                    a control wheel rotatable over a range of positions;  
4                    a sensing element in communication with the control wheel and configured  
5 to detect a speed of rotation of the wheel; and  
6                    a processor in electrical communication with the sensing element, the  
7 processor configured to correlate wheel rotational speed with a magnitude of power  
8 provided from a source to a model vehicle.

1                    13.      The apparatus of claim 12 wherein the processor is configured to  
2 multiply a distance of rotation of the wheel by a factor based upon speed of knob rotation.

1                    14.      The apparatus of claim 12 wherein the processor is configured to  
2 generate the factor proportional to the speed of knob rotation.

1                    15.      The apparatus of claim 12 wherein the sensing element comprises  
2 an optical detector, and the apparatus further comprises:  
3                    a light source; and  
4                    a rotatable disk intervening between the light source and the optical  
5 detector, the rotatable disk communication with the knob and including gaps spaced at  
6 regular angular increments to allow optical communication between the light source and

7 the detector, wherein the processor is configured to detect knob rotation speed based upon  
8 a rate of changed transmission of light.

1 16. The apparatus of claim 15 wherein the sensing element further  
2 comprises a second optical detector positioned at a different location along a rotational  
3 range of the disk, the processor further configured to detect a direction of knob rotation  
4 based upon a phase difference between electrical signals produced from the first and  
5 second optical detectors.

1 17. The apparatus of claim 12 wherein the sensing element comprises  
2 an optical detector, and the apparatus further comprises:  
3 a light source; and  
4 a rotatable disk intervening between the light source and the optical  
5 detector, the rotatable disk communication with the knob and including reflecting  
6 elements spaced at regular angular increments to allow optical communication between  
7 the light source and the detector, wherein the processor is configured to detect knob  
8 rotation speed based upon a rate of changed reflection of light.

1 18. The apparatus of claim 17 wherein the sensing element further  
2 comprises a second optical detector positioned at a different location along a rotational  
3 range of the disk, the processor further configured to detect a direction of knob rotation  
4 based upon a phase difference between signals produced from the first and second optical  
5 detectors.

1 19. The apparatus of claim 12 further comprising an antenna configured  
2 to allow the processor to communicate with the power source through a wireless signal.

1 20. The apparatus of claim 12 further comprising a wired  
2 communication link between the processor and the power source.